fore contemporary with the temple," though certain of them contained secondary burials. The sarcophagi of the Princesses Kensit and Kauit will henceforth rank as important examples of the eleventh-dynasty workmanship.

The fifth chapter, by Prof. Naville, is devoted to the twelfth-dynasty monuments found in the temple area, and to the worship, in the later periods of Egyptian history, of King Neb-hatep-ra, the founder of the temple. The most important monument of the twelfth dynasty unearthed was a red granite stela of Senusret III. (why do the authors retain the obsolete transliteration Usertsen?) recording a royal decree to the priest of Amon and to the officials of Thebes, " ordering rations of bread, and beer over and above what had been given before, in order to increase the offerings of his forefather Neb-hatep-ra." This stela, more than one and a half metres high, has since been removed to the Cairo Museum.

In the last chapter, M. Naville deals with his discovery of the famous Hathor Shrine containing the Cow-statue, at present one of the chief objects of interest in the museum at Cairo. This splendid specimen of the Egyptian sculptor's work M. Naville believes dates from the reign of Thothmes III., but it bears the name of his son, Amenhetep II. A fine coloured reproduction of it is given in pl. i., from a water-colour drawing by Mr. Reach.

Several of the photographic plates are poorly reproduced, but a word of praise ought to be given to the line drawings of Madame Naville, which, as always, are excellent.

BIOGRAPHY OF AN INVENTOR.

Thomas Alva Edison: Sixty Years of an Inventor's Life. By Francis Arthur Jones. Pp. xvi+375; with 22 illustrations. (London: Hodder and Stoughton, 1907.) Price 6*s.* net.

"IT is estimated," so Mr. Francis Arthur Jones tells us, " that if everything that has ever been written and published about Edison were collected and re-published in book form, it would make a library of a thousand volumes—each volume containing an average of a hundred thousand words." The present biography is a most readable and interesting book, which gives a very good insight into Edison's life in the space of 375 pages. It is written for the general rather than the scientific reader. It would be a capital book to place in the hands of schoolboys, and if juvenile readers were to play at setting up make-believe printing presses in railway trains in emulation of Edison's first attempts at educating himself the amusement would be a harmless and instructive one, if they did not reproduce the fiasco which first put the youthful inventor " down on his luck."

This biography should do much to disillusion the impressions which are so commonly formed about successful men, that they only have to invent something in order to make a fortune. It shows clearly that the only road to success is through failure. His career as telegraphic operator was most precarious, and one of his first inventions—a vote-recording machine for election purposes—was refused, really because it was too ingenious and perfect; in fact, it could not be tampered with. His resolve never to invent anything which was not wanted by the community at large helped him greatly, but still the telegraph companies would not seriously consider his systems of multiplex telegraphy until he had done something more. That something was to help them out of difficulties when a breakdown occurred. His successes in obtaining his first cheque from the Gold Indicator Company, and in securing the adoption of his improvements in telegraphy, were only achieved when he had shown his capacity of being handy man in an emergency. Then the success of his inventions in connection with the telephone and phonograph was only bought at the cost of long and patient attempts at trying first one substance and then another for the transmitter of the former and the cylinder of the latter. As to the continual litigation which fell on Edison's shoulders in order to protect his patents, Mr. F. A. Jones's information regarding the large staff of solicitors employed in Edison's legal department bears abundant testimony.

In the later chapters we see how even success brought troubles with it in the form of a crowd of reporters, interviewers, cranks and faddists, and it cannot be doubted that Edison's good humour and ready wit, of which we have here many amusing instances, no less than his indomitable energy and perseverance, were greatly needed in order to enable him to cope with all the work that fell on his shoulders. His biographer is also at considerable pains to disillusion the reader as to the wild and fantastic inventions attributed by unscrupulous newspaper reporters to " the wizard of Menlo Park," and to which the name " Munchausen science " has been given. Unfortunately, many of these tall stories have been read and widely believed in England, and no one is stronger in his condemnation of such fictions than Edison himself.

It would be very desirable that a further book should some day be published dealing more especially with the scientific aspect of Edison's work. It would undoubtedly be a difficult task to write such a book. If Edison did not study at a university in the accepted meaning of the term, he certainly appears to have made a university for himself in his workshops, in which he was his own professor, and it cannot be denied that the training he underwent under these conditions was fully as efficient, and in many ways better, than a course modelled on conventional lines. His education was undoubtedly thoroughly scientific in the best sense of the word, but it was different in the matter of technicalities from that of the ordinary science student. Consequently Edison nowhere figures as a contributor of papers in transactions and periodicals. Some evidence is given in this book that results published elsewhere as " researches " were well known to him years previously. His " notion books," couched though they be in a mysterious language of their own, must contain a lot of important new results, and it will be a pity if no steps are taken to render these results accessible to scientific workers at

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some future time, if not now. The statement that Edison is now devoting himself exclusively to pure science thus becomes welcome news.

The book is illustrated in the approved style with "Edison at the age of four," "Edison at nineteen," "Edison at forty," and so forth, also "Mr. and Mrs. Edison in the laboratory"; altogether more than a score of illustrations.

We think that one person is kept rather more in the background than is really necessary in this book, that person being Mr. Francis Arthur Jones. He shows such an intimate knowledge of and friendship with Mr. and Mrs. Edison that some further reference to his personal relations with them would not only be justifiable, but would give an added interest to the biography.

We must, however, direct attention to the statement on the last page:—

> "Of the force hidden in coal about 15 per cent. only is available, the other 85 per cent. being wasted That is why it requires so many hundreds of tons o coal to propel a liner across the Atlantic. When the problem of generating electricity direct is solved, then two or three tons of coal only will be needed for the same purpose."

"Many hundreds of tons" is, of course, a somewhat elastic term, and we do not know whether Mr. Edison or Mr. Francis Arthur Jones is responsible for the above statement, but taking, say, five hundred tons by way of argument, it is surely a little unnecessary for either of those gentlemen to imperil his reputation for the sake of seventy-two tons of coal.

G. H. BRYAN.

A FRENCH TREATISE ON GEOLOGY.

Traité de Géologie. I. Les Phénomènes géologiques. By É. Haug. Pp. 536; 195 figs., 71 plates. (Paris: Armand Colin, 1907.) Price 12.50 francs.

AMONG the most important of the perpetual needs of geology is the frequent renewal of the international supply of advanced text-books, from which the general conclusions of foreign authorities and the outlines of the geology of foreign lands may be learnt apart from the now overwhelming mass of original literature. In such books the interests of the local students, to whom illustrations of normal phenomena are most important, to some extent conflict with the requirements of foreign geologists, who will profit by the description of exceptional occurrences; but fortunately most authors of advanced works may be trusted to enliven their books by a sufficient number of special cases to make them useful to foreign geologists. The issue of an extensive treatise on geology by Prof. Émile Haug, of the University of Paris, is, therefore, to be warmly welcomed by British geologists, as we may expect it to give an instructive account of geological phenomena in France, a guide to the original literature, and a clear exposition of the current state of geological thought in that country.

Prof. Haug's first volume deals with geological processes and materials. In his statement of the relations of geology to allied sciences he lays stress on the essential importance in geology of the succession of phenomena; and this idea finds frequent expression in the book, from the first chapter on the geological cycle to the last on theories of orogenesis The volume opens with an account of the general morphology of the earth, and he says that "the geological history of our planet is nothing else than the history of its successive cycles"; and he regards the three main subdivisions of geological history, for which he uses the names Primary, Secondary and Tertiary, as each a great cycle beginning with very active sedimentation, followed by intense crustal movements, and closing with a period of great consequent denudation. He suggests that the "pre-primary" was a similar cycle, and that the "post-tertiary" will be another."

In his description of rocks he follows the guidance of the same principle by describing them under the headings of lithogenesis, orogenesis, and glyptogenesis, *i.e.* their formation, modification, and destruction. He then proceeds to biological geology, discussing the life of the continents and the distribution of botanical and zoological provinces. The author attaches no value to the theory of the permanence of oceans and basins; and although he notices the objections of Koken and Frech to the assumed Pacific continent, he warmly maintains its former existence. According to Prof. Haug, there were five great continents in Secondary times—the North-Atlantic continent, the South Atlantic or Brazilio-African continent, the Sino-Siberian continent, the Austral-Indian-Madagascan continent, and the Pacific continent. He maintains the Mesozoic existence of these continents, and the fundamental difference from the present distribution of land and water, as a necessary consequence, both of the tectonic structure of the earth and of the distribution of animals and plants. He maintains that:—

> "The enigmas of zoological geography are absolutely insoluble if one regards only the existing state of things. But as soon as one admits that the distribution of lands and seas was not, in geological epochs anterior to our own, the same as it is to-day, all these facts become clear in a new light."

After three chapters dealing with the sedimentary rocks, and one on mineral-fuels, the author discusses tectonic geology, crustal movements, and the phenomena of volcanoes and earthquakes. The chapter on fuels shows the author's thorough chemical knowledge of his subject. The excellent chapters on mountain structure are illustrated by numerous clear diagrams to explain the views and terms of Suess, and by artistic photographs of those French Alpine regions where the author has made important researches.

In the treatment of so wide a range of subjects there are naturally a few slips; thus the author four times refers to Ceratodus as living in Tasmania instead of Queensland, and he follows another important recent text-book in the statement that the New Zealand geysers were destroyed by the eruption of 1884. That eruption, however, though it destroyed the sinter

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